GOVERNMENT OF INDIA
EARTH SCIENCES
LOK SABHA

UNSTARRED QUESTION NO:3290
ANSWERED ON:07.12.2007
CHANGE IN THE SHAPE OF THE EARTH
Maharia Shri Subhash

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether Government is aware that on the basis of data of satellite Laser Ranging, NASA has revealed that size of the earth is changing;

(b) if so, the details thereof;

(c) whether NASA has come to any conclusion regarding Indian sub-continent; and

(d) if so, the details thereof?

Answer

MINISTER OF SCIENCE AND TECHNOLOGY AND MINISTER OF EARTH SCIENCES (SHRI KAPIL SIBAL)

a) Yes Sir.

b) The study, carried out by Minkang Cheng and Byron D. Tapley, of the Center for Space Research, University of Texas at Austin and published in June, 2005 issue of the Journal of Geophysical Research-Solid Earth, suggests that significant variations in the shape of the Earth, defined by the Earth`s gravity field, or geoid, during the past 28 years might be partially linked to climate events.

The study examined Earth`s oblateness, how much its rounded shape flattens at the poles and widens at the equator. Scientists measured the distance from ground stations to satellites by using Satellite Laser Ranging (SLR) data that are accurate within one millimeter.

The data reflected mass changes as water redistributed in oceans, atmosphere, and in soil due to changes in earth's climate system. As per the study, the redistribution resulted in slight changes of the Earth`s gravity field, detectable with geodetic satellites, which study the size and shape of the Earth. Although, the study tries to relate earth's oblateness with SLR data, it says that the cause of a variation in the Earth`s mass over the 21-year period between 1978 and 2001, however, still remains a mystery. Hence, they propose for more studies to rely on the SLR technology support for monitoring the variations in the shape of the earth.

However, as per another school of thought, satellite laser ranging technique is a positional technology similar to Global Positioning System (GPS) for obtaining instantaneous position on the surface of the earth or for measuring baseline very accurately and hence such technologies can not be used in isolation for determining the size and shape of the earth.

c) No Sir.

d) In view of the above, does not arise.